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10/541,878	07/08/2005	Tadashi Iwamatsu	63793(70801)	7946
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EDWARDS ANGELL PALMER & DODGE LLP			EXAMINER	
P.O. BOX 55874			TRAN, THUY V	
BOSTON, MA 02205			ART UNIT	PAPER NUMBER
			2821	
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			07/03/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/541,878

Applicant(s)

IWAMATSU ET AL.

Examiner

Thuy V. Tran

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on amendment submitted on 03/23/2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 7-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 10-13 is/are allowed.
- 6) ☒ Claim(s) 1-9 and 14-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 July 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

This Office Action is in response to the Applicants' amendment submitted on 03/23/2007.

In virtue of this amendment:

- Claim 6 is canceled;
- Claims 10-17 are newly added; and thus,
- Claims 1-5 and 7-17 are now presented in the instant application.

Applicants' arguments filed on March 23, 2007 have been fully considered but they are not persuasive <sup>See Remarks and Conclusion</sup>. Therefore, the rejections of claims 1-9 (claim 6 is now canceled) remain sustained.

### *Claim Objections*

1. Claim 4 is objected to because of the following informalities:

Claim 4, line 3, "pulsed" should be deleted (since both [Vps] and [Vc] are of DC sources having no any other elements, either implicitly or explicitly, to generate pulse signal(s) and furthermore there is no support for such "pulsed", or pulse signals, provided in the specification).

Appropriate correction is required.

2. Claims 14-17 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim, or claim 1 properly. Applicants are required to cancel the claims, or amend the claims to place the claims in proper dependent form, or rewrite the claims in independent form. While all the limitations recited in claims 14-17 are directed to a method or manner of operating the device of claim 1, upon which they depend, they do not constitute any further limitations to the device of claim 1. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

4. Claims 14-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 14-17 tend to direct to a method/process of use or operation while claim 1, upon which claims 14-17 depend, on its face is directed to a self-cleaning electron emission device; and as such, it does not apprise a person of ordinary skill in the art of its scope of the claimed invention. Furthermore, the limitations recited in claims 14-17, which are directed to a method or manner of operating the self-cleaning electron emission device of claim 1, do not differentiate the claimed device (of claim 1) from a prior art device. If Applicants insist on retaining a method claim, separately rewriting the claims in an independent form is suggested.

Clarification is required.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Komoda et al. (U.S. Patent No. 6,249,080 B1); hereinafter "Komoda".

With respect to claim 1, Komoda discloses, in Fig. 3, a self-cleaning electron emission device (used in a solid vacuum device; see col. 2, line 48) comprising (1) an electron emitter including a lower electrode [2], an upper electrode [7] made of a thin film [7] (see col. 6, lines 52-53), and a semiconductor layer [1, 5, 6] formed between the lower electrode [2] and the upper electrode [7], a surface of the upper electrode [7] being exposed to an external space (between [7] and [21] as shown in Fig. 3); (2) a counter electrode [21] (or [31, 32, 33] in Fig. 17) that is provided opposite the upper electrode [7] across the external space; (3) first voltage control means [Vps] for selectively applying voltages between the lower [2] and upper electrodes [7] an electron emitting voltage having a polarity (which is positive polarity; see col. 8, line 7) for accelerating electrons in the semiconductor layer [1, 5, 6] such that the accelerated electrons [e-] are passed through the upper electrode [7] and emitted to the external space (note: since the word “or” makes an alternative, the limitation “a predetermined voltage ... no voltage” recited in lines 13-17 is not selectively considered), and (4) second voltage control means [Vc] for selectively applying at least one voltage (which is the DC voltage Vc; see col. 8, lines 8-10) between the upper electrode [7] and counter electrode [21] having a predetermined relationship (such as Vc is at 100 V, Vps is at 15 V; see col. 8, lines 22 and 27) to the voltage applied between the lower [2] and upper electrodes [7] by the first voltage control means [Vps] such that with no atmospheric discharge (only electric discharge caused by the DC voltage emitted accelerated electrons (see Fig. 3) are transferred toward the counter electrode (note: since the word “or” makes an alternative, the limitation “subsequent to being charged ... the counter electrode” recited in lines 23-26 is not selectively considered).

With respect to claim 2, Komoda discloses that the semiconductor layer [1, 5, 6] is a porous silicon semiconductor layer in which a part [6] or all of the polysilicon is made porous (see col. 6, lines 50-51).

With respect to claim 3, Komoda discloses, in Fig. 17, that the counter electrode [31, 32, 33] has an insulating layer [33] (which is of glass; see Fig. 17; col. 14, line 9) formed on a surface facing the upper electrode [7].

With respect to claim 4, Komoda discloses that the second voltage control means [Vc] applies a voltage (which is a DC voltage Vc; see col. 8, lines 8-9) so that the counter electrode [21] has a positive potential relative to the upper electrode [7] (see col. 8, lines 8-10) when the predetermined relationship (such as Vc is at 100 V, Vps is at 15 V; see col. 8, lines 22 and 27) between the voltage applied between the upper [7] and lower electrodes [2] and the voltage applied between the upper electrode [7] and the counter electrode [21] is such that fine particles adhered to the surface of the upper electrode [7] are caused to fly from the upper electrode toward the counter electrode [21].

With respect to claim 5, the limitation "wherein the flying voltage control section operates a control to apply the voltage having a first voltage value to the external space between the upper electrode and the counter electrode, and after the fine particle charging voltage control section applies a predetermined voltage between the upper electrode and the lower electrode to charge the fine particles attached to the surface of the upper electrode, the flying voltage control section operates a control to apply the voltage having a second voltage value higher than the first voltage value, the second voltage value having such a magnitude that allows the charged fine particles to fly from the upper electrode to the counter electrode and that atmospheric discharge

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does not occur, and the fine particle charging voltage control section operates to control to either apply a voltage having an opposite polarity to a polarity of the electron emitting voltage or apply no voltage between the upper electrode and the lower electrode, thereby allowing the charged fine particles to fly from the surface of the upper electrode to the counter electrode” recited in lines 1-17 is not of patentable merits since it is directed to a manner of operating the electron emission device which does not differentiate apparatus claim from the prior art. A claim containing a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus if the prior art apparatus teaches all the structural limitations of the claim. See MPEP § 2114.

With respect to claim 6, the limitation “wherein the flying voltage control section is constructed to be capable of setting a polarity of a voltage applied between the upper electrode and the lower electrode to either positive or negative, the flying voltage control section operates a control to apply a voltage having a second voltage value having such a magnitude that allows the charged fine particles to fly from the upper electrode to the counter electrode and that atmospheric discharge does not occur, and the fine particle charging voltage control section operates to control to either apply a voltage having an opposite polarity to a polarity of the electron emitting voltage or apply no voltage between the upper electrode and the lower electrode, thereby allowing the charged fine particles to fly from the surface of the upper electrode to the counter electrode” recited in lines 1-13 is not of patentable merits since it is directed to a manner of operating the electro emission device which does not differentiate apparatus claim from the prior art. A claim containing a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed

apparatus from a prior art apparatus if the prior art apparatus teaches all the structural limitations of the claim. See MPEP § 2114.

With respect to claim 7, Komoda discloses that the flying voltage control section [Vc] applies a voltage between the upper electrode [7] and the counter electrode [21] when the electrons are not emitted from the electron emitter so that the surface of the upper electrode [7] of the electron emitter is negative (since [Vc] supplies a voltage to the counter electrode [21] at a positive polarity with respect to [7]; see col. 7, lines 9-10).

With respect to claim 8, Komoda discloses that the electron emission device is inherently for use in a laser printer or a digital copying machine (since Komoda teaches that the device is for use in a planar light emitting apparatus or all being of a kind capable of emitting light uniformly; see col. 2, lines 47-49).

With respect to claim 9, Komoda inherently (since Komoda teaches that the device is used with a solid vacuum device; see col. 2, line 48) discloses that the fine particles include dust such as toner and paper particles.

***Allowable Subject Matter***

7. Claims 10-13 are allowed.

8. The following is a statement of reasons for the indication of allowable subject matter:

Prior art fails to disclose a method for cleaning fine particles from an electron emission device comprising while at the same time (with applying the predetermined voltage for charging fine particles adhered to the surface of the upper electrode between the upper electrode and the lower electrode) applying a voltage having a predetermined relationship to the voltage applied between the upper electrode and the lower electrode between the upper electrode and the counter



electrode for a period sufficient for the fine particles adhered to the surface of the upper electrode to assume a predetermined level of charge, in combination with the remaining claimed limitations as called for in independent claim 10 (claims 11-13 are allowed since they are dependent on claim 10).

***Remarks and conclusion***

9. In response to Applicants' argument on the rejection of claim 1 in the last paragraph at page 12 that Applicants can find no teaching, disclosure or suggestion within the Komoda reference to the effect that [Vps] applies a voltage for charging fine particles attached to the surface of the upper electrode between the upper electrode [7] and the lower electrode [2], it is noted that Fig. 3 of Komoda clearly shows that the voltage source [Vps] applies a DC voltage Vps within the upper electrode [7] at a positive polarity with respect to the lower ohmic electrode [2] causing electrons including fine particles adhered to the surface of the upper electrode [7] or between the upper and lower electrodes [7, 2] (see Figs. 3-4; col. 8, lines 6-8).

10. In response to Applicants' argument on the rejection of claim 1 in the first paragraph at page 13 that Applicants can find no teaching, disclosure or suggestion within the Komoda reference to the effect that the "fine particle charging voltage section [Vps]" of the Komoda reference applies a voltage of a reverse polarity to the voltage tending to cause emitted electrons to move toward the counter electrode or no voltage during the course of operation, it is noted that the feature upon which Applicants rely (i.e., a voltage of a reverse polarity) is not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

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11. In response to Applicants' argument on the rejection of claim 1 in the last paragraph at page 13 that it is made clear that the normal operation of an electron emission device as described by the Komoda reference will not inherently clean fine particles from the surface of the upper electrode, it is noted that the device of Komoda with the availability of power source connections has a capability of cleaning or moving electrons and fine particles under some degrees of electrical fields and electrostatic forces.

12. In response to Applicants' argument in the first paragraph at page 14 that it clearly is not true that the Komoda reference in any manner recognizes, much less deals with, the problem of reduced electron emission current caused by the accumulation of fine particles adhered to the surface of the upper electrode of the emitter, it is noted that the feature upon which Applicants rely is not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

For the aforementioned, claims 1-9 remain rejected under 35 U.S.C. 102(b) as being anticipated by Komoda.

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

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CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

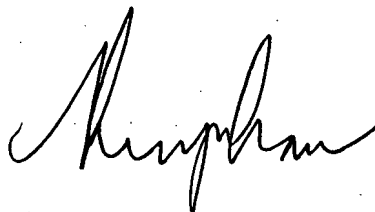
***Inquiry***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thuy V. Tran whose telephone number is (571) 272-1828. The examiner can normally be reached on M-F (8:00 AM -4:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Owens Douglas can be reached on (571) 272-1662. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

06/25/2007



**THUY V. TRAN  
PRIMARY EXAMINER**